

A STUDY OF NEUQUENAPHIS BLANCHARD, 1939, WITH DESCRIPTIONS OF NEW SPECIES (APHIDIDAE, HOMOPTERA)

by

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ABSTRACT

In this paper the following new species are described from Chile and Argentine: *Neuquenaphis bulbicauda*, from *Nothofagus dombeyi*; *Neuquenaphis essigi* and *Neuquenaphis flavipes*, from *Nothofagus obliqua*; *Neuquenaphis palliceps*, from *Nothofagus dombeyi*; *Neuquenaphis schlingeri*, *Neuquenaphis sensoriata* and *Neuquenaphis similis*, from *Nothofagus obliqua*.

Neuquenaphis edwardsi (Laing, 1927), *Neuquenaphis chilensis* Essig, 1953, and *Neuquenaphis michelbacheri* Essig, 1953 are redescribed. Oviparae and a male of *Neuquenaphis*, as well as first instar larvae are described for the first time. The genus *Spicaphis* Essig, 1953, type-species *Spicaphis michelbacheri* Essig, 1953, is considered a synonym of *Neuquenaphis* Blanchard, 1939, type-species *Myzocallis edwardsi* Laing, 1927; after which *Neuquenaphis michelbacheri* (Essig, 1953, p. 69), because of *Neuquenaphis michelbacheri* Essig, 1953, p. 66, requires a new name (p. 274).

The systematic position of the genus *Neuquenaphis* is discussed.

INTRODUCTION

Dr. Evert I. Schlinger, Riverside, California, made a collecting trip through Chile and Argentina to Tierra del Fuego. At my request he gave special attention to the aphids living on *Nothofagus* spp. The many samples he collected were preliminarily sorted by Dr. Robert C. Dickson, Riverside, California, and the majority of the aphids were put at my disposal. The present paper is based on this large material, and besides on the following: a type borrowed from the California Academy of Sciences, San Francisco; some type material obtained in exchange from the University of California, Berkeley; and a small collection borrowed from the British Museum (Natural History), London.

Three samples of alatae, each consisting of one or two specimens belonging to the difficult *Neuquenaphis edwardsi* group, have not been classified. Several samples of apterae from the most southern part of South America differ slightly from each other, but, as discussed sub *Neuquenaphis edwardsi* (Laing), the significance of the differences could not be determined.

HISTORY

Blanchard (1939) erected *Neuquenaphis* for *Myzocallis edwardsi* Laing, 1927. Essig (1953) described *Neuquenaphis michelbacheri* spec. nov. and *Neuquenaphis chilensis* spec. nov., and he also erected the genus *Spicaphis* for *Spicaphis michelbacheri* spec. nov. He thought it possible that *Spicaphis michelbacheri*, known only from one apterous viviparous female, was the same species as *Neuquenaphis chilensis*, known only from 3 alate

females, but this seems less probable after Dr. Schlinger collected the alate of presumably *Spicaphis michelbacheri* together with the apterous viviparous female. From this alata it is clear that *Spicaphis* Essig, type-species *Spicaphis michelbacheri* Essig, 1953, is a synonym of *Neuquenaphis* Blanchard, 1939. *Spicaphis michelbacheri* Essig, 1953, is mentioned in this paper under *Neuquenaphis essigi* spec. nov.

GENERAL MORPHOLOGY

In apterae body about 1.40—3.10 mm long, from rather slenderly pyriform to very broadly oval, not depressed. All or most of the dorsal hairs placed on elongate, somewhat scabrous processes which on top besides the hair have 4—5 spinules. The processes arranged as follows: 2 on the front each bearing 2 hairs, 0 to 6 on vertex each bearing 1 hair like all the other processes; on thorax and abdomen processes in spinal, pleural and marginal rows down to abdominal tergite VI or VII; tergite VIII with 2 processes; pronotum and abdominal tergite VII usually without pleural processes; in near-adult nymphs and sometimes in adult apterae a more or less complete row of processes between the pleural and marginal ones, the submarginal processes; exceptionally a number of small, rather irregularly placed, smaller processes between the usual rows, from mesonotum to abdominal tergite VII; in one species the spinal and pleural processes on the middle portion of the dorsum not or hardly developed, but the submarginal ones quite large. Sclerotisation of dorsum variable; mostly only the head sclerotic and more or less pigmented, sometimes the spinal, pleural and marginal processes on pigmented sclerotic plates that may fuse to more or less corrugated sclerotic transverse bars. Dorsal hairs in general very short, nearly always blunt, sometimes obovate or capitate, but those hairs that are not placed on processes usually longer and frequently subacute or acute. Under-side of head mostly with 4—6 hairs in an oval just below the front, 2—4 more between the eyes; in one species in the apterous viviparous female with about 40 hairs. Front straight or slightly concave, often with a slight median bulge. Antennae of 6 segments with nearly always segment III longer than IV; the latter subequal to V, and longer than basal part of VI; processus terminalis not shorter, mostly very much longer than base of segment VI; antennal hairs variable in number, but remarkably uniform in shape, stiff, blunt to subacute at angles of about 40°, $\frac{1}{5}$ — $\frac{1}{2}$ of basal diameter of segment III long; secondary rhinaria absent; primary rhinaria with a fringe of tapering hairs. Eyes with many facets, with distinct triommatidium on the caudal side. Rostrum not much varying in length, reaching the middle coxae; ultimate segment always blunt with straight or convex sides, from shorter than its basal width to just over twice as long as its basal width, with 4—11 hairs besides the 3 subapical pairs. Legs rather stout, with about equal distances between coxa I, II, and III; all femora normal, about equally thick; tibiae in viviparae about cylindrical, in oviparae the hind tibiae swollen and with circular pseudosensoria, usually with a few very inconspicuous spinules between the hairs near apex; first tarsal joints dorsally very short, ventrally long, with a single row of spinules along most of the distal margin, with ventrally 1 short hair and mostly 6 long hairs; second tarsal joints with spinules or spinulose imbrications; empodial hairs sinuate near base, rod-shaped with slightly spatulate tip, narrow ribbon-shaped, or widening towards apex; claws normal. Siphunculi usually pigmented, truncated conical, to rather elongate in oviparae, with a usually wide flange, from smooth to slightly transversely reticulated near apex, always with one hair near base to halfway their length on anterior surface.

Cauda in apterae viviparae and oviparae divided into two parts by a very strong constriction; the apical portion or knob variable in shape, from spherical to bluntly cylindrical, sometimes pointed, with a considerable number of hairs often only laterally and on the underside. Subanal plate rather deeply incised in the middle. Subgenital plate normal, with several rows of rather long, acute hairs along posterior margin, and usually several hairs on its disc. The 4 rudimentary gonapophyses at equal distances, each with 2—3 hairs in apterae viviparae, but the middle pair fused to one with 5—6 hairs in oviparae. Oviparous female on sternites VI and VII with a pair of transverse, striate and punctate, very dark sclerotic plates that might be wax glands.

In alates body as large as in apterae viviparae, but much more slender. Mostly only the spinal and marginal hairs on abdomen on elongate processes, and all the other processes of apterae obsolete; normally the spinal processes of abdominal tergites I—III very long and thin, those on more posterior tergites, like the marginal ones quite short, and those on the last 3 tergites again longer; rarely either all spinal processes on abdomen of more or less equal length, or all hardly developed, or several additional dorsal processes present on thorax and abdomen. Head and thorax mostly pigmented, to black; abdomen with more or less pigmented intersegmental sclerites, sometimes with marginal sclerites and/or with sclerotic plates at the bases of the spinal processes. Dorsal hairs very different from those in apterae, up to 10 times as long, thorny or with fine apices, arranged as in apterae. Front always concave, with small frontal tubercles. Antennae much longer than in corresponding apterae; segment III with 1—30 rather narrow transversely oval rhinaria side by side near the middle of the segment or extending towards the apex from near the middle of the segment in alate females; rhinaria slit-like, very numerous and round about segments III, IV, V and base of VI in males; all secondary rhinaria ciliate, but sometimes the fringe of hairs incomplete or indistinct; processus terminalis comparatively longer than in apterae; primary rhinaria larger and with finer cilia than in apterae, with the accessory rhinaria on segment VI packed against the primary rhinarium; flagellum mostly nearly smooth on basal half of segment III, gradually more distinctly imbricated apicad. Legs long and slender; middle coxae very near the hind coxae and very far from the fore coxae; fore femora, except in one species, markedly incrassate and much thicker than the middle or hind femora, constricted laterally and dorsally just before the apex, dorso-apically strongly pigmented, and ventrally at the subapical constriction with a tooth; fore tibiae shaped like the other tibiae but with a bulge dorsally near the quite black base, the fore tibiae with 4, the middle tibiae with 3 or 4, the hind tibiae with 3 strong, tooth-like spines at apex, ventrally; first tarsal joints dorsally much longer than in apterae and there with 2 hairs, ventrally with 7 hairs. Wings all well developed, with normal venation, with mostly rather dark veins that may be distinctly bordered, or seemingly clear cut with under high power a very faint border, or with a very short border at the bases of the basal and cubital veins in which case the veins end in dark triangles. Siphunculi apparently implanted on a marginal sclerite that protrudes mediad, darker and more slender than in apterae, cylindrical in one male, nearly always very distinctly reticulated with isodiametric cells and a few rows of strongly transverse cells near apex or, in the male, over nearly their whole surface, with a very little developed flange. Cauda similar to that of apterae, but with more slender and more tapering knob. Other characters as in apterae.

First instar larvae or embryos as far as available with antennae of 5 segments, 2 frontal processes with bifid apices, 2 processes on vertex, a full complement of spinal, pleural

and marginal, but no submarginal processes to abdominal tergite VI, 4 processes on tergite VII, and 2 on tergite VIII; all these processes nearly smooth but for the spinulose apex, and with the same type and size of apical hairs as adult apterae; eyes with many facets; first tarsal joints spinulose, with 2 hairs ventrally; siphunculi absent.

Larger larvae always with distinct submarginal dorsal processes, from the second instar with siphunculi, and with the kind of hairs of apterae irrespective of the fact that they might develop into alatae.

SYSTEMATIC POSITION

The systematic position of *Neuquenaphis* is very interesting. Laing (1927) placed the type-species in *Myzocallis* Pass., i.e., in the Phyllaphidini. Essig (1953) put *Neuquenaphis* in the subfamily Callaphidinae, but *Spicaphis* in a new subfamily, the "Spicaphina". Börner & Heinze (1957) considered *Neuquenaphis* a member of the *Drepanosiphum* relationship. Heie (1967) wants to put *Neuquenaphis* together with *Sensoriaphis* Cottier in a particular tribe, not named, which he wants to assign to the Callaphididae sensu Börner, 1952, my Phyllaphidini. Clearly there is considerable agreement among these authors when the nomenclature they use is translated.

The material, especially that of first instar larvae and sexuales, at my disposal, could enhance further determination of the position of the genus. The structure of the curious sclerotic plates of oviparous *Neuquenaphis bulbicauda* spec. nov., apparently the same as what Cottier (1953, p. 102) described, suggests that *Sensoriaphis* Cottier, 1953 is very closely related.

Dorsal processes occur in widely different aphid genera, and therefore are of hardly any use for speculations on phylogeny. But the type of processes found in *Paoliella* Theobald and its relatives, with one minute apical hair and a number of spinules, rather strongly resembles that of *Neuquenaphis*. These African genera also have ciliate secondary rhinaria, no siphunculi in first instar larvae, and the adult's siphunculi show a hair on the anterior surface. The fore femora in alatae are frequently thickened though without a ventro-apical tooth. The tibiae have very few spinules. The empodial hairs are only at the apex thickened, and the number of rudimentary gonapophyses is usually four. However, the nymphs generally have no compound eyes, the head has a very marked V-shaped suture. Structurally the *Paoliella* group of genera apparently shows considerable resemblance to *Neuquenaphis*, and the differences should not be overestimated. It should be emphasized that in Phyllaphidini the occurrence of four rudimentary gonapophyses is very rare.

Chaitophorini do have four rudimentary gonapophyses. The reticulated siphunculi of *Neuquenaphis* remind one immediately of *Periphyllus* v. d. Hoeven and *Chaitophorus* Koch, though in those genera there is no hair on the siphunculi. Their empodial hairs resemble those of *Neuquenaphis*. But there are no dorsal processes, and the secondary rhinaria have no cilia around them. First instar larvae without siphunculi are found in some *Periphyllus* spp.

The Drepanosiphini have three rudimentary gonapophyses, like the ovipara of *Neuquenaphis bulbicauda* spec. nov. They often have a curious, pigmented chitinous structure caudad of the genital porus (as depicted in Davatchi, Hille Ris Lambers & Remaudière, 1957, p. 126, fig. 5), and traces of this are refound in *Neuquenaphis*. The

fore femora of alate Drepanosiphini are just like those of alate *Neuquenaphis*, incrassate, with a subapical constriction, and with a ventro-apical tooth. Siphunculi have no hair, but in one case, *Yamatocallis takagii* Tak., there is some reticulation not unlike that in *Neuquenaphis schlingeri* spec. nov. First instar larvae invariably show siphunculi. Dorsal processes are at least in one genus common in alatae, though never in apterae of larvae.

Apparently *Neuquenaphis* is a very controversial genus. The oviparae have a structure that may be some unusual type of subsiphuncular wax gland. The dorsal processes and several other features resemble those of the African *Paoliella*-like genera, but the latter have in alatae a distinct V-shaped ridge in the head capsule, and rather different fore femora.

Several characters are as in Chaitophorini, but the fore femora are typically like those in Drepanosiphini. The host plants, *Nothofagus* spp. belong to a rather primitive plant order, many genera of which are infested by Phyllaphidini, but they are not known to be inhabited by Chaitophorini or Drepanosiphini (sensu H.R.L.). In fact, it is impossible to be positive about the position of *Neuquenaphis*, but it could be fitted into Heie's (1967) phylogenetic tree at a point where his Callaphididae (my Phyllaphidini) separate from his Chaitophoridae (my Chaitophorini). This tree should then be modified so, that first the Phyllaphidini are split from the ancestors of the Neuquenaphidini, after which the Drepanosiphini and Chaitophorini branch from the Neuquenaphidini. The alternative to this speculation seems to be, that Chaitophorini, Phyllaphidini, Neuquenaphidini, Paoliellini and Drepanosiphini are lumped together.

BIOLOGY

All known species of the genus live on trees of the genus *Nothofagus* Blume in South America, according to Dr. Schlinger on the undersides of the leaves. Dr. Schlinger collected most species on *Nothofagus obliqua*, some on *N. dombeyi*, and one on *N. antarctica*. Some of the unidentified samples came from *Nothofagus* sp. on Tierra del Fuego where also *N. betuloides* and *N. pumilio* occur.

The life history of the various *Neuquenaphis* species has not been investigated, and the material at hand does not offer many clues. In *N. essigi*, *N. edwardsi*, *N. palliceps* and *N. schlingeri* the simultaneous occurrence of apterous and alate viviparae is known, and one may assume that this also occurs in *N. bulbicauda* and *N. similis*. But in *N. michelbacheri*, *N. sensoriata*, and *N. flavipes*, of which many alatae were collected, apterae either do not occur simultaneously with alatae, or they are very rare. Nothing points to the existence of alate fundatrices.

So far sexuals, several oviparae and an alate male, are only known in *N. bulbicauda*, and they were collected on Februari 6, the equivalent of August 6 on the northern hemisphere, i.e., very early in the year. There is a possibility that the apterae viviparae collected before and simultaneously with the oviparae are fundatrices as they contain embryos with the type of hairs found on the oviparae but different from those found on the apterae viviparae. That would suggest a very unusual life cycle, consisting of only two generations, as may occur in certain arctic aphids.

Dr. Cottier told me that in *Sensoriaphis sensoriata* Cottier the oviparae do not lay ellipsoid eggs as all other oviparae do, but disc-shaped eggs. Unfortunately the oviparae of *Neuquenaphis* at my disposal contain no eggs.

KEY TO THE SPECIES

a. Alate viviparous females.

- 1 (2) Dorsal spinal processes on the anterior 5 or 6 abd. tergites not developed, not longer than their half-way width. Processus terminalis much longer than ant. segment III. Siphunculi not with distinct reticulation, only with 2—3 rows of very strongly transverse cells near apex. On *Nothofagus obliqua*
. *N. schlingeri* spec. nov.
- 2 (1) Dorsal spinal processes at least on abd. tergites I—III well developed and some of these several times as long as their half-way width. Processus terminalis usually shorter than ant. segment III. Siphunculi with several rows of more or less isodiametric cells, rarely not reticulated.
- 3 (6) Vertex with at least 4 elongate hair-bearing processes. Cauda with the knob not or hardly longer than wide, roundish.
- 4 (5) Fore wings with all the veins bordered with brown. Mesonotum with 6 long hair-bearing processes. Processes in posterior row on vertex much longer than their half-way diameter. Fore femora $1\frac{1}{2}$ times as thick as other femora. On *Nothofagus dombeyi* (?) *N. chilensis* Essig
- 5 (4) Fore wings with clear-cut veins. Mesonotum with 4 long hair-bearing processes. Processes in posterior row on vertex not longer than their half-way width. Fore femora twice as thick as other femora. On *Nothofagus dombeyi* (?), *N. obliqua* *N. essigi* spec. nov.
- 6 (3) Vertex without or with two hair-bearing processes; also those on the front sometimes developed. Sometimes the basal vein in the fore wings very faintly bordered, but not the others. Knob of cauda mostly much longer than its largest width, tapering.
- 7 (8) Processus terminalis more than 1 mm long, $5\frac{1}{2}$ — $7\frac{1}{4}$ times as long as basal part of ant. segment VI. Ant. segment III with only 1—6 rhinaria. Head pale honey-coloured with dark to black rings around the ocelli. Last rostral segment not or hardly longer than its basal width, very blunt. On *Nothofagus dombeyi*. *N. palliceps* spec. nov.
- 8 (7) Processus terminalis less than 1 mm long, rarely more than 5 times as long as basal part of ant. segment VI. Ant. segment III usually with more than 5 rhinaria. Last rostral segment much longer than its basal width.
- 9 (10) Fore femora not noticeably thicker than the other femora. Pleural processes on abdominal tergites I—VII distinct, mostly longer than their half-way width. Fore wings covered with very fine scales with the exception of an elongated field between wing base and basal vein. Last rostral segment divided by a mostly colourless, constricted zone into two parts of which the distal one is hairless. On *Nothofagus dombeyi* *N. bulbicauda* spec. nov.
- 10 (9) Fore femora much thicker than the other femora. Pleural processes on abdomen not developed. Fore wings with large fields without any scales. Last rostral segment not subdivided.
- 11 (12) Processus terminalis short, only $2\frac{1}{6}$ times as long as basal part of ant. segment VI. Ant. segment III with 12—30 rhinaria. Last rostral segment with 13—18 hairs. On *Nothofagus obliqua* *N. sensoriata* spec. nov.

- 12 (11) Processus terminalis $3\frac{1}{4}$ — $5\frac{1}{2}$ times as long as basal part of ant. segment VI. Ant. segment III with 3—15 rhinaria. Last rostral segment very exceptionally with more than 12 hairs.
- 13 (14) Antennae $12\frac{1}{5}$ — $12\frac{1}{3}$ times as long as body. Ant. segment III with 9—15 rhinaria. Dorsal processes on abd. tergites I—III completely unpigmented. On *Nothofagus obliqua* and perhaps *N. dombeyi*. *N. michelbacheri* Essig
- 14 (13) Antennae $11\frac{1}{4}$ — $11\frac{1}{2}$ times as long as body. Ant. segment III with 3—9 rhinaria. Dorsal processes on abd. tergites I—III brownish, often on dark sclerotic plates without a paler centre.
- 15 (16) Hind femora not, or only just visibly darker than the fore femora. On *Nothofagus obliqua*. *N. flavipes* spec. nov.
- 16 (15) Hind femora very much darker than fore femora. On various *Nothofagus* spp. Complex of *N. edwardsi* (Laing)

b. Apterous viviparous females.

- 1 (2) Head with only 2, frontal, dorsal processes. Abdomen only at the periphery with long processes, the spinal ones absent or very short. On *Nothofagus obliqua*. *N. schlingeri* spec. nov.
- 2 (1) Head with at least 4 long processes, on the front and on vertex. Spinal processes not much shorter than the marginal ones.
- 3 (6) Head on vertex with a transverse row of 4 rather long processes. Abdominal tergite VII usually with 6 processes. Processus terminalis mostly less than $1\frac{1}{2}$ times as long as basal part of ant. segment VI.
- 4 (5) Cauda with a globular or transversely oval knob. Hairs on top of the dorsal processes all knobbed with cylindrical shaft. On *Nothofagus obliqua* and perhaps *N. dombeyi*. (?*Spicaphis michelbacheri* Essig). *N. essigi* spec. nov.
- 5 (4) Cauda with the knob often not longer than its maximum width, but then with a rather acute conical apex. At least part of the hairs on the dorsal processes sessile, shaped like a stratosphere balloon, at least 0.008 mm thick. On *Nothofagus dombeyi*. *N. bulbicauda* spec. nov.
- 6 (3) Head with two long processes on vertex between the eyes. Abdominal tergite VII with only 4 processes. Knob of cauda always elongated.
- 7 (8) Last rostral segment very blunt, not or hardly longer than its basal width. On *Nothofagus dombeyi*. *N. palliceps* spec. nov.
- 8 (7) Last rostral segment more than $1\frac{1}{3}$ times as long as its basal width.
- 9 (10) Body large, more than 2.50 mm, antennae about $1\frac{1}{2}$ times as long as body. All hairs on top of dorsal processes distinctly capitate or with striate, enlarged apex, comparatively long; those on the spinal processes of abdominal tergites I—III 0.013—0.020 mm long. Embryos with dorsal hairs of up to 0.013 mm long, capitate. On *Nothofagus obliqua*. *N. similis* spec. nov.
- 10 (9) Body very rarely up to 2.40 mm long, but then antennae not or hardly longer than body. Hairs on dorsal processes sometimes with swollen apices, but usually the apex still thinner than the base of the hair. Embryos with dorsal hairs of less than 0.004 mm, usually much shorter than the spinules on the processes. On various *Nothofagus* spp. Complex of *N. edwardsi* (Laing)

DESCRIPTIONS OF THE SPECIES

Neuquenaphis bulbicauda spec. nov.

(Plate 15, figs. 5—8; Plate 17, fig. 16; Plate 18, fig. 17)

Alate viviparous female (from one specimen).

Head and thorax blackish sclerotic; abdomen with inconspicuous brownish intersegmental sclerites, and with distinct dark, spinal, pleural and marginal sclerites on which the dorsal processes are placed. Processes on the front about as long as the hairs on their top, waisted; vertex with two processes about as long as wide; pronotum with 4 spinal, mesonotum with two distinct spinal ones slightly longer than their half-way width; mesonotum with two spinal ones 2—3 times as long as their half-way width; abdomen with the spinal processes gradually shorter from tergite I, where they are 8—10 times as long as their half-way width, to tergite VIII; pleural processes on tergites I—VII very distinct, as long as or longer than their half-way width, and longer than the more conical marginal and submarginal ones. Hairs on top of the processes thorny, rather acute, about 0.014—0.018 mm long. Antennae brown; segments III near their middle with 3 and 4 transversely oval, distinctly ciliate rhinaria; last rostral segment about 0.09 mm long, hairs broken, but probably 5 hairs present besides the 3 subapical pairs. Legs with the femora all about equally dark, tibiae paler; fore femora about 0.07 mm wide, at most $1\frac{1}{10}$ times as thick as the middle femora, with a not conspicuous ventro-apical tooth; hind tibiae with some 15—20 spinules near apex; second tarsal joints distinctly spinulose; empodial hairs bent, linear. Wings with normal venation, veins not bordered and not with dark triangles at their tips; surface of fore wings evenly scaly. Siphunculi smooth, rather cylindrical distally, markedly reticulated with 4—5 rows of isodiametric cells and a few rows of transverse cells. Cauda paler than siphunculi, with the more or less triangular knob about $1\frac{1}{8}$ times as long as its basal, largest, width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III 3 & 4	Siph.	Cau.
			III	IV	V	VI			
1	1.81	2.44	0.60	0.49	0.43	0.14 + 0.63		0.13	0.17

(from *Nothofagus dombeyi*, 8 km W. of La Picada, El Refugio, Volcan Osorno (Osorno), 6.II.'67, leg. E.I.S. 67-2-6c).

Apterous viviparous female.

Body about 2.25—3.10 mm long, very broadly oval, about $2\frac{1}{2}$ times as long as wide. Anterior part of head blackish brown sclerotic, posterior part pale; thorax rather pale; abdomen pale, with blackish brown intersegmental sclerites, not with sclerites at the base of the dorsal processes. The latter numerous; head with 2 on front, and 4 in a transverse row between the eyes; pronotum with 4 spinally, 2 marginally; mesonotum with 4 spinally, 4 marginally; metanotum like abd. tergites I—IV with 2 spinally, 2 pleurally, 2 submarginally, 2 marginally; tergites V—VI without the submarginal ones; tergite VIII only with 2 spinal ones, and with 2 small hairs not on processes; all the processes thick and short, $2\frac{1}{2}$ —4 times as long as their half-way width, with very broad bases, the spinal

ones on abdomen from 0.050 mm (tergite I) to 0.13 mm (tergite VII) long; all blackish brown with pale bases, bluntly imbricated with blunt apical spinules; submarginal processes hardly shorter than the marginal ones. Hairs on top of the processes variable, from rod-shaped on the front, to often almost stem-less, capitate, often with very thick oboval knob of up to 0.008 mm wide on abdomen. Antennae in the available specimens only $1\frac{1}{3}$ — $\frac{3}{7}$ of length of body, with blackish brown basal segments; flagellum brownish yellow at base, blackish brown towards apex, bluntly imbricated; processus terminalis 1 — $1\frac{1}{3}$ times as long as basal part of segment VI; hairs on segment III rather erect and spiny, about 0.015 mm long; primary rhinaria small, indistinctly fringed or rather combed with strongly tapering hairs. Ventral side of head with very numerous, about 60, hairs, in strong contrast to the normal number of ventral hairs elsewhere. Rostrum reaching just past hind coxae; last segment about 0.30 mm long; with a subapical membranous constriction separating a blackish apical hairless part; hairs on basal half at least partly fine, up to 0.040 mm long, 3—5 in number (besides the 3 subapical pairs). Legs short, stout, thick-walled, yellowish brown with the femora dorso-apically, the tibiae at base dorsally and at apex blackish brown, with numerous rather spiny, partly bluntish hairs of about 0.035 mm long; tarsi not spinulose, not distinctly imbricated; empodial hairs rather thickly rod-shaped with spatulate tip. Siphunculi blackish brown, rather slender, very indistinctly transversely reticulated with 3—4 distinct rows of cells at apex, with wide flange; subbasal hair club-shaped, stout, about 0.009 mm long. Cauda very dark, markedly knobbed; the knob onion-shaped, with acute apex, hardly longer than its greatest width, with numerous hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.33	1.01	0.27	0.17	0.15	0.10 + 0.14	0.11	0.21
2	3.00	1.05	0.26	0.19	0.16	0.11 + 0.15	0.13	0.27
3	2.76	0.97	0.26	0.18	0.14	0.09 + 0.14	0.13	0.23
4	2.67	1.16	0.32	0.22	0.16	0.11 + 0.16	0.14	0.28
5	2.57	0.96	0.23	0.15	0.14	0.10 + 0.15	0.11	0.22
6	3.06	1.11	0.30	0.19	0.16	0.13 + 0.14	0.13	0.30

(1, from *Nothofagus dombeyi*, 8 km E. of Pucon (Cautin), Chile, 9.II.'67, leg. E.I.S. 67-2-9c; 2, from *Nothofagus dombeyi*, 2 km SW. of Villarica (Cautin), Chile, 18.XII.'66, leg. E.I.S. 66-12-18a; 3, from *Nothofagus dombeyi*, 20 km E. of Caramavida (Arauca), Chile, 31.I.'67, leg. E.I.S. 67-1-31c; 4, from *Nothofagus dombeyi*, 35 km W. of Angol (Malleco), Chile, 12.II.'67, leg. E.I.S. 67-2-12b; 5, from *Nothofagus dombeyi*, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E.I.S. 67-2-10d; 6, from *Nothofagus* sp., Puerto Eden, Wellington Island (Magallanes), Chile, 4.XII.'58, leg. Kuschel, BMNH no. 40/60).

Oviparous female.

Rather like apterous viviparous female, but more elongated, much smaller, 1.50—1.90 mm long. Dorsal processes much more slender, longer, spinal ones on abd. tergite I 0.11 mm, on tergite VII 0.16 mm, to 9 times as long as their half-way width; abd. tergite VII with only 4 processes. All hairs on the tops of dorsal processes sessile and balloon-shaped,

0.010 mm thick. Antennae $\frac{1}{2}$ — $\frac{2}{3}$ of length of body; processus terminalis about $1\frac{1}{2}$ times as long as base of segment VI; hairs on segment III at most 0.004 mm long, blunt. Underside of head with only 6 hairs, as normal. Last rostral segment as in preceding morph. Legs more slender, rather evenly brownish yellow, with straight tibiae; hind tibiae half-way about $1\frac{1}{2}$ times as thick as the other tibiae, with on the inner side about 40—50 somewhat tuberculate pseudosensoria of 0.004—0.007 mm diameter; second tarsal joints with some spinules. Siphunculi rather dark brownish, slender, on the large flange with some coalescing transverse lines; subbasal hair club-shaped, placed in a shallow, flat pit. Cauda very different, dark, with the acorn-shaped, blunt knob $1\frac{1}{2}$ times as long as its largest width. Caudad and mediad of each of the (ventral) abdominal stigmal pori of segments VI and VII very dark brownish black sclerites which are densely striate, the striae apparently consisting of very dense rows of minute pin-pricks, but in profile these sclerites completely smooth. Rudimentary gonapophyses rather distinctly 3, but the middle one with twice as many chaetae as the lateral ones. Subgenital plate roundish, evenly hairy.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	1.55	0.96	0.26	0.15	0.15	0.11 + 0.16	0.12	0.20
2	1.85	0.97	0.29	0.16	0.13	0.10 + 0.15	0.14	0.26
3	1.81	0.94	0.26	0.15	0.14	0.11 + 0.15	0.14	0.20
4	1.52	0.95	0.27	0.14	0.14	0.11 + 0.16	0.14	0.21

(no. 1—4, from *Nothofagus dombeyi*, 8 km W. of La Picada, El Refugio, Volcan Osorno (Osorno), Chile, 6.II.'67, leg. E.I.S. 67-2-6c).

Alate male (from one specimen).

Body 1.29 mm long. Head and thorax blackish brown sclerotic; abdomen without local sclerotisation or pigmentation. Dorsal processes on head and thorax not developed, on abdomen only spinally present, the longest on tergite I 0.030 mm long, the rest shorter, all more or less similar in size, and less than 0.022 mm long; all pale or vaguely brownish. Antennae blackish brown, segments III—V and base of VI covered round about with short, slit-like, much protruding, ciliate rhinaria. Underside of head with 6 hairs. Last rostral segment 0.10 mm long, structurally as in apterae viviparae but with only 2 hairs of 0.016 mm besides the 3 subapical pairs. Legs dark throughout; fore femora not thicker than hind femora, ventrally with a normal apex; hind tibiae with more than 20 spinules near apex, the other tibiae without spinules; first tarsal joints of fore and middle legs only with some spinules along the ventral margin, but those of hind legs like all the second joints with many spinules over their whole surface. Wings with pale brown, normal venation, evenly covered with small scales with the exception of a rather narrow zone near posterior margin between basal vein and basis of wing. Siphunculi dusky, cylindrical with suddenly expanded base, the cylindrical part more than twice as long as wide, with coarse isodiametric or even longitudinal reticulation from tip to base; subbasal hair broken or absent. Cauda paler than siphunculi, strongly knobbed, the knob very slender, blunt, 0.091 mm long, 0.040 mm wide. Genitalia apparently normally developed.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				III	Rhin. on segment			Siph.	Cau.
			III	IV	V	VI		IV	V	VI		
1	1.29	2.04	0.61	0.41	0.30	0.14 + 0.46	69 & 72	36 & 31	14 & 16	5 & 3	0.12	0.13

Discussion. It would not have been possible to believe that the oviparae described here were conspecific with the apterae viviparae if the latter did not contain embryos. For these embryos clearly show hairs in the shape of a stratosphere balloon of the same type as those found on the dorsal processes of the oviparae, and almost equally thick. In the sample with oviparae there was one very mouldy aptera vivipara that was not measured, and that also shows the very hairy underside of the head present in the other viviparae.

The male and alata described above differ even more from the apterae viviparae, but they belong here unless there is still another *Neuquenaphis* on *Nothofagus dombeyi* of which no other morph or nymph was collected. The fore femora are not enlarged and nearly lack the ventro-apical process. The fore wings are evenly covered with small scales whereas in nearly all other species of which alatae are available these scales occur in a very distinct pattern, and are completely absent elsewhere. Therefore I could not associate the male and the alate female with one of the other species. The main reason for considering them conspecific with *N. bulbicauda* is in the structure of the last rostral segment, which is like that of the apterae viviparae and the oviparae.

The apterae viviparae are almost certainly very old specimens, but they may well be fundatrices. If this is right, this species is unique among aphids in having only two generations per annum, for these apterae seem to produce the oviparae, and, presumably, the males. The few nearly adult nymphs in the sample by their structure appear to be young oviparae.

Types. Holotype: Apterous viviparous female (no. 2 of measurements), from *Nothofagus dombeyi*, 2 km SW. of Villarica (Cautin), Chile, 18.XII.'66, leg. E. I. Schlinger no. 66-12-18a. Paratypes: 1 apterous viviparous female, from *Nothofagus dombeyi*, 8 km E. of Pucon (Cautin), Chile, 9.II.'67, leg. E. I. Schlinger no. 67-2-9c; 1 aptera vivipara, from *Nothofagus* sp., Puerto Eden, Wellington Island (Magallanes), Chile, 4.XII.'58, leg. Kuschel, BMNH no. 40/60; 1 aptera vivipara, from *Nothofagus dombeyi*, 20 km E. of Caramavida (Arauca), Chile, 31.I.'67, leg. E. I. Schlinger no. 67-1-31c; 1 aptera vivipara, from *Nothofagus dombeyi*, 35 km W. of Angol (Malleco), Chile, 12.II.'67, leg. E. I. Schlinger no. 67-2-12b; 1 aptera vivipara, from *Nothofagus dombeyi*, 18 km W. of Angol (Malleco), Chile, leg. E. I. Schlinger no. 67-2-10d; 1 damaged aptera vivipara, 1 alate male, 1 alate female, and 6 oviparae, from *Nothofagus dombeyi*, 8 km W. of La Picada, El Refugio, Volcan Osorno (Osorno), Chile, 6.II.'67, leg. E. I. Schlinger no. 67-2-6c.

Neuquenaphis chilensis Essig, 1953

(Plate 18, fig. 18)

1953. Essig, E. O., Proc. Calif. Acad. Sc. (IV) 28 : 67—69, *Neuquenaphis chilensis*.

Alate viviparous female.

Body about 2.20 mm long. Head and thorax dark sclerotic; abdomen only with vague, small intersegmental sclerites and rather pale marginal sclerites. Head with 2 frontal

processes of about 0.060 mm each with 2 hairs, 2 more posterior ones of about 0.040 mm, and a row of 4 on vertex of about 0.025 mm long; pronotum with 4 spinal processes of about 0.090 mm and 2 pleural ones of about 0.074 mm; mesonotum with 4 spinal ones of about 0.090 mm, and 2 between the posterior spinal ones of about 0.060 mm; metanotum with 4 in a row of about 0.027 mm; abdominal tergite I only with 2 spinal ones of about 0.078 mm, and thick, conical marginal and submarginal ones of about 0.026 mm; tergites II—VII with an unpaired, variable (0.013—0.035 mm long) median process, 2 spinal processes of 0.043—0.078 mm, occasionally very small pleural processes, and rather distinct, thickly conical, marginal and submarginal processes. Hairs on top of the processes nearly all very blunt, about 0.016 mm long, sometimes with tapering, sometimes with incrassate apices. Antennae about $\frac{6}{7}$ of length of body, with very dark basal segments, and yellowish, apicad dark, flagellum; segment III on the middle fourth part with 6 transversely oval, markedly ciliate rhinaria; hairs on segment III rather numerous, about half as long as diameter of the segment at its strongly constricted base. Rostrum with the more or less elongated acorn-shaped ultimate segment faintly tapering towards base, more strongly towards apex, about 0.11 mm long, not constricted distad the subapical hairs, with 5 hairs besides the 3 subapical pairs. Femora brown, tibiae paler; fore femora paler than the other femora, in the middle about 0.105 mm thick, about $1\frac{1}{2}$ times as thick as the middle femora; apices of hind tibiae with very few, 5—8, spinules; second tarsal joints not very spinulose. Wings with normal venation, evenly scaly; veins dark smoky, all broadly but very vaguely bordered with very pale brown, with distinct brown triangles at their apices. Siphunculi dark, truncated conical, completely smooth, with wide flange; subbasal hair on a tubercle, at apex thicker than at base. Cauda dark, with the knob nearly spherical, about as long as its largest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	2.19	1.89	0.60	0.40	0.30	0.17 + 0.25	6 & 6	0.09	0.16

(1, holotype, "beating at Hacienda San Andrés, Paraque, Chile, Jan. 15, 1957, A. E. Michelbacher").

Discussion. Through the kindness of Dr. P. H. Arnaud I could examine the type of this species. The species was described from three specimens, from *Nothofagus dombeyi*, Purranque, Osorno, but the paratypes were out on loan and could not be examined.

It appears to be very closely related to *N. essigi* spec. nov., but there are marked differences in the number and sizes of the processes on the head and the mesonotum, in the shapes of the hairs on top of the dorsal abdominal processes, in the sculpture of the siphunculi, and in the shape of the secondary rhinaria, the latter being much more strongly transverse in *N. essigi* than they are in *N. chilensis*. From Essig's figure one gets the impression that the veins in the wings are heavily bordered, but this is not so marked. However, the alate specimen of *N. essigi* happens to be very much darker after clearing than the type of *N. chilensis*, and therefore the banded veins would seem to be a reliable difference.

Presumably also *N. chilensis* must have an apterous morph, and if this is true, it may be very difficult to distinguish it from that of *N. essigi*. In fact, there is reasonable doubt

whether the insect described here intentionally as a new species under the name *N. essigi* is really the same as *Spicaphis michelbacheri* Essig, the single existing specimen of which could not be examined. It is not impossible that *Spicaphis michelbacheri* Essig, 1953, is really a synonym of *N. chilensis* Essig, 1953. It is, however, clear, that *N. essigi* spec. nov. is not a synonym of *N. chilensis*.

Type. Holotype: Alate viviparous female, beaten from presumably *Nothofagus dombergii*, Purránque (Osorno), Chile, 15.I.'51, leg. A. E. Michelbacher. Paratypes: 2 alate viviparae with data as for holotype.

***Neuquenaphis edwardsi* (Laing, 1927)**

(Plate 17, figs. 13, 15)

1927. Laing, F., Rev. Soc. Ent. Argentina 2 : 23—24, *Myzocallis edwardsi*.

1939. Blanchard, E. E., Physis (Buenos Aires) 17 : 880—881, *Neuquenaphis edwardsi* Laing.

Alate viviparous female 1).

Body about 1.85—2.35 mm long. Head and thorax almost black; abdomen with small, blackish, intersegmental sclerites and with slightly paler marginal, pleural, and spinal hair- or process-bearing sclerites, of which the marginal ones are the largest, the pleural ones the smallest and vaguest. Processes on front, pronotum and mesonotum very rarely developed; those on abd. tergites I, II and III dark, cylindrical, often constricted near base, to 0.075 (0.097) mm long and about 7 times as long as their half-way width; sometimes also tergite IV with rather tall processes, those on more posterior tergites normally short, often shorter than wide, but those on VII and VIII again longer; hairs on top of spinal processes of tergites I—III 0.016—0.022 (0.021—0.045) mm long, very nearly acute, to very acute. Antennae $1\frac{1}{3}$ — $1\frac{2}{5}$ ($1\frac{1}{4}$ — $1\frac{1}{2}$) times as long as body; brownish to dark brown, gradually darker towards apex, with the very base of segment III quite pale and the part bearing the rhinaria always just darker than the part basad; segment III at or just basad the middle with a very compact row of 3—8 (3—9), rarely 2, strongly transverse rhinaria with conspicuously long (0.0045—0.005 mm) cilia; processus terminalis not more than 0.75 (0.67) mm long, $3\frac{2}{3}$ — $5\frac{1}{4}$ times as long as base of segment VI. Last rostral segment about 0.10 mm long, at base just over half its length, with 4—6 hairs besides the 3 subapical pairs. Legs brownish yellow to yellowish brown, but always with the middle and especially the hind femora very much darker to black, darker than the siphunculi; maximum width of fore femora about 0.11—0.13 mm, length about 0.60 mm; hind tibiae with more than 10 spinules near apex; second tarsal joints spinulose. Wings with normal venation; veins brown, seemingly clear cut, but at least the basal vein under high power very faintly and narrowly bordered; none of the veins with even a trace of dark triangles at their tips. Siphunculi dark, reticulated with about 4—5 rows of more or less distinctly isodiametric cells and 3—4 rows of strongly transverse cells; subbasal hair about 0.022 (0.026—0.039) mm long. Cauda dark, but paler than the siphunculi, with the rather slender, blunt knob $1\frac{2}{3}$ —2 ($1\frac{1}{2}$ — $1\frac{2}{3}$) times as long as its largest width.

¹⁾ If for an organ two sets of figures are given, the one between brackets refers to southernmost material.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	2.02	2.77	0.79	0.59	0.51	0.15 + 0.56	5 & 6	0.14	0.19
2	1.92	2.63	0.76	0.54	0.46	0.14 + 0.56	5 & 6	0.11	0.16
3	2.03	2.86	0.82	0.60	0.49	0.13 + 0.66	4 & 5	0.11	0.19
4	1.97	2.89	0.83	0.55	0.51	0.15 + 0.68	4 & 6	0.11	0.21
5	2.22	2.88	0.76	0.57	0.54	0.15 + 0.68	5 & 6	0.11	0.20
6	1.96	2.82	0.82	0.50	0.46	0.14 + 0.73	4 & 4	0.12	0.18
7	2.04	2.85	0.80	0.55	0.48	0.15 + 0.69	3 & 4	0.11	0.21
8	1.99	2.89	0.77	0.54	0.46	0.16 + 0.58	3 & 4	0.10	0.19
9	1.91	2.83	0.84	0.55	0.47	0.14 + 0.67	4 & 6	0.11	0.16
10	2.23	2.83	0.82	0.56	0.49	0.17 + 0.60	6 & 6	0.10	0.18
11	2.25	3.02	0.90	0.62	0.53	0.16 + 0.67	6 & 8	0.12	0.18
12	1.86	2.62	0.77	0.51	0.40	0.14 + 0.64	7 & 9	0.10	0.17
13	2.19	2.73	0.79	0.53	0.49	0.14 + 0.61	8 & 8	0.11	0.17

(1—2, paratypes, from *Nothofagus* sp., Bariloche (Neuquen), Argentine, 1.XIII.'26, leg. F. W. Edwards; 3—4, from *Nothofagus obliqua*, 35 km W. of Angol (Malleco), Chile, 12.II.'67, leg. E.I.S. 67-2-12a; 5—6, from *Nothofagus glauca* or *obliqua*, 12 km W. of Cuesta Santa Julia (Rio Negro), Argentine, 17.XII.'66, leg. E.I.S. 66-12-17b; 7, from *Nothofagus glauca* or *obliqua*, Las Trancas (Nuble), Chile, 15.II.'67, leg. E.I.S. 67-2-15b; 8, from *Nothofagus antarctica*?, Laguna Amarga (Magallanes), Chile, 7.XII.'66, leg. E.I.S. 66-12-7a; 9—13, from *Nothofagus* sp., Puerto Williams, Navarino Isl. (Tierra del Fuego), Chile, I.'59, leg. Kuschel).

Apterous viviparous female.

Body pear-shaped, about 2.00—2.50 mm long. Tergum mostly with head brownish sclerotic, abdomen with vague brownish transverse bars bearing the spinal and pleural processes and with marginal brownish sclerites, or quite pale. Submarginal processes either absent, or very erratically one of only $\frac{1}{4}$ the length of nearest marginal processes present. All processes more or less pigmented, from just brownish to blackish brown, mostly rather curved, slender, the spinal ones of abd. tergite III, e.g., 8—10 times as long as their half-way width, and about 0.13 mm long; their apical hairs on a specimen and between specimens variable in length and shape, sometimes very short (0.004 mm) hairs markedly capitate, but longer hairs on the same specimen cylindrical; in some samples all hairs on spinal processes of abd. tergites I—III very short (0.003—0.006 mm), sometimes all these hairs over 0.009 mm long. Antennae $\frac{9}{10}$ — $\frac{11}{10}$ times length of body, in one specimen (fundatrix?) $\frac{2}{3}$ of length of body, pale with basal segments and apex darkish, from basal $\frac{1}{3}$ part of segment III apicad gradually more distinctly imbricated; processus terminalis $3\frac{1}{4}$ — $3\frac{3}{4}$ times length of base of segment VI, but in one specimen (fundatrix?) only $2\frac{2}{3}$ times base of segment VI; in one specimen 2 & 3 roundish rhinaria present on ant. segment III. Rostrum mostly reaching past middle coxae; last segment mostly twice or more times as long as its basal width, about 0.11—0.12 mm long, with 4—6 hairs besides the 3 subapical pairs. Legs rather short, with the pigmentation correlated with the sclerotisation of dorsum; coxae and femora from pale brownish to blackish brown; tibiae evenly pale, to blackish apically, near apex with some spinules, often in transverse rows. Siphunculi dark to black, volcano-shaped with wide, thick flange, short, smooth with two rows of more or less complete, very strongly

transverse reticulations on the flange. Cauda rather dark, variable as to shape of knob which is $1\frac{2}{3}$ — $2\frac{1}{5}$ times as long as its largest width in most specimens.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.13	1.91	0.48	0.33	0.31	0.13 + 0.47	0.12	0.26
2	2.42	1.68	0.45	0.30	0.27	0.14 + 0.36	0.13	0.27
3	2.10	1.82	0.47	0.32	0.28	0.13 + 0.45	0.13	0.26
4	2.10	2.03	0.54	0.37	0.34	0.15 + 0.45	0.14	0.24
5	2.25	2.07	0.50	0.38	0.38	0.15 + 0.47	0.12	0.26
6	2.06	2.12	0.57	0.35	0.35	0.14 + 0.50	0.11	0.22
7	2.36	2.13	0.59	0.39	0.36	0.14 + 0.46	0.13	0.26
8	2.19	2.20	0.52	0.40	0.38	0.15 + 0.56	0.13	0.24

(1, from *Nothofagus antarctica*, Laguna Amarga (Magallanes), Chile, 7.XII.'66, leg. E.I.S. 66-12-7a; 2—5, from *Nothofagus* not *antarctica*, 35 km S. of Estancia Cameron (Tierra del Fuego), Chile, 2.XII.'66, leg. E.I.S. 66-12-2d; 6, from *Nothofagus antarctica*?, 27 km N. of Punta Arenas (Magallanes), Chile, 27.XI.'66, leg. E.I.S. 66-11-27a; 7—8, from *Nothofagus* sp., Puerto Williams, Navarino Island (Tierra del Fuego), Chile, I.'59, leg. Kuschel BMNH 39/60).

Discussion. Through the kindness of Dr. V. F. Eastop I could examine two paratypes. These have fewer secondary rhinaria than mentioned in the original description.

Alatae of *edwardsi* strongly resemble those of *N. flavipes* spec. nov. but they differ by the dark hind femora which usually are much darker than the fore femora. Specimens that have been treated too long in KOH, or teneral specimens, cannot be distinguished with certainty from alatae of *N. flavipes* spec. nov.

Alatae from the area from which F. Laing described the species agree excellently with the type material. But specimens collected from *Nothofagus* species other than *obliqua*, on Tierra del Fuego, are less certainly *N. edwardsi* (Laing). They show on an average longer dorsal hairs, and a great variation in the development of the dorsal processes. In some specimens nearly all the spinal processes are very elongated.

The apterae that have been described here as *N. edwardsi* may belong to several similar species of which only the alatae were described. These apterae show a last rostral segment of 0.11—0.12 mm long except in one specimen in which they are 0.10 mm, and a very great variation in pigmentation, from a uniformly pale dorsum to brown transverse bars across the abdominal tergites. Such dark specimens differ from pale specimens by having longer dorsal hairs. In one sample from *Nothofagus antarctica* the cauda is thicker than in the others. The second aptera measured has rather shorter antennae, and it might be a fundatrix. Careful study of embryos did not give an answer to the question whether the observed differences are differences between clones, or differences between taxa.

The alate material collected in the type area suggests that *Nothofagus obliqua* is really a hostplant. In other samples containing alatae there is no certainty about the host species. Dr. S. J. van Ooststroom informed me that *Nothofagus obliqua* has been recorded from Tierra del Fuego besides *N. antarctica*, *N. betuloides*, and *N. pumilio*.

Types. Holotype: Alate viviparous female, from *Nothofagus* sp., Bariloche (on the label Bauloche, perhaps meant San Carlos de Bariloche?) (Neuquen), Argentine,

1.XII.'66, leg. F. W. Edwards. Paratypes: Alatae with data as for holotype.

Further material: 24 alatae, from *Nothofagus obliqua*, 35 km. W. of Angol (Malleco), Chile, 12.II.'67, leg. E. I. Schlinger no. 67-2-12a; 3 alatae, from *Nothofagus glauca* or *obliqua*, 12 km W. of Cuesta Santa Julia (Rio Negro), Argentine, 17.XII.'66, leg. E. I. Schlinger and M. E. Irwin no. 66-12-17b; 1 alata, from *Nothofagus glauca* or *obliqua*, Las Trancas (Nuble), Chile, 15.II.'67, leg. E. I. Schlinger no. 67-2-15b; 1 alata, from *Nothofagus antarctica* (?), Laguna Amarga (Magallanes), 7.XII.'66, leg. E. I. Schlinger and M. E. Irwin 66-12-7a; 10 alatae, from *Nothofagus* sp., Puerto Williams, Navarino Islands (Tierra del Fuego), Chile, Jan. 1959, leg. Kuschel BMNH no. 39/60; 11 apterous viviparous females, from *Nothofagus* not *antarctica*, 35 km S. of Estancia Camerón (Tierra del Fuego), Chile, 2.XII.'66, leg. E. I. Schlinger and M. E. Irwin 66-12-2d; 2 apterae, from *Nothofagus antarctica*?, 27 km N. of Punta Arenas (Magallanes), Chile, 27.XI.'66, leg. E. I. Schlinger no. 66-11-27a; 1 aptera, from *Nothofagus antarctica*?, Laguna Amarga (Magallanes), Chile, 7.XII.'66, leg. E. I. Schlinger no. 66-11-7a; 1 aptera, from *Nothofagus antarctica*, 37 km S. of San Carlos de Bariloche (Rio Negro), Argentine, 17.XI.'66, leg. E. I. Schlinger and M. E. Irwin, 66-11-17a; 2 apterae, from *Nothofagus* sp., Puerto Williams, Navarino Isl., Tierra del Fuego, Chile, I.'59, leg. Kuschel BMNH 39/60.

Neuquenaphis essigi spec. nov.

(Plate 19, figs. 19, 20)

?1953. Essig, E. O., Proc. Calif. Acad. Sc. (IV) 28 : 69—70, *Spicaphis michelbacheri*.

Alate viviparous female (from one specimen).

Body rather large and broad. Head and thorax blackish; abdomen with strongly transversely oval, dark intersegmental sclerites and rather marked, dark brown marginal sclerites, but no spinal or pleural sclerites. Head with 2 frontal processes of about 0.060 mm long, 2 of about 0.025 mm more caudad, and 4 small ones not higher than their basal width between the compound eyes; pronotum with 2 spinal pairs of about 0.10 mm, and a marginal pair of about 0.060 mm; mesonotum with 2 spinal pairs of about 0.080 mm; metanotum with a pair of about 0.035 mm; abdominal tergites I—IV each with a very slender, curved, almost cylindrical, spinal hair of about 0.085—0.10 mm, a small, only 0.015 mm long marginal pair, and a large, strongly tapering, very thick, submarginal pair of about 0.045 mm long, and besides these, an extremely small pleural pair; on tergites V—VII the spinal and pleural pairs all quite small, mutually not much differing in size, but the marginal pair still large though rather slender; on tergite VIII only a spinal pair as large as the marginal ones of tergites V—VII; additional small scattered processes present on tergite VI and especially on VII; all these processes are nearly smooth also at the top, and dark brown. On each process an apical, subacute, spiny hair of about 0.016—0.025 mm long, but the frontal processes each with two bluntish hairs; besides these hairs on processes, a small number of additional, smaller, dorsal hairs not on processes are present on abdominal tergites I—VII. Antennae dark brown with blackish basal segments, but the very base of segment III quite pale; just below the middle of segment III a group of strongly transverse rhinaria, slightly more than their smallest width from each other, with long (0.006 mm) cilia; hairs on segment III very numerous, about 150 per mm length of segment, acute, spiny, at angles of about 40°, and about 0.016 mm long. Last rostral segment about 0.115 mm long, with probably

4 hairs besides the 3 subapical pairs. Legs normal; fore femora swollen to twice thickness of hind femora, dark honey-brown, like all tibiae; middle and hind femora black; tibiae without spinules; first tarsal joints with two of its hairs very long, to 0.052 mm, and very stout; second tarsal joints not very spinulose; empodial hairs slightly spatulate at their tip. Wings with rather dark, normal venation; veins seemingly clear cut, but actually hardly visibly bordered (high power!). Siphunculi not darker than marginal sclerites, smooth with 5—6 transverse striae near the very large flange; subbasal hairs bluntish, not at all capitate, 0.016 mm long. Cauda dark brown; knob almost globose, as long as or just shorter than wide, only on basal half spinulose, with 27 hairs all marginally and ventrally. Rudimentary gonapophyses 3, far apart, with 2, 2, 1 hair, respectively.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	2.52	2.35	0.78	0.63	0.49	0.22 + 0.33	6 & 7	0.11	0.16

(from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E.I.S. 66-11-1a).

Apterous viviparous female (from one specimen).

Body very broadly oval, at most $1\frac{1}{2}$ times as long as wide, 2.40 mm long. Tergum with distinct dark brown local sclerotisation consisting at a minimum of round sclerotic plates at bases of each spinal, pleural, and marginal dorsal process, and smaller ones at bases of additional dorsal processes; at a maximum sclerotic plates more or less completely fused to dark transverse bars, first on posterior tergites. Dorsal processes arranged as follows: front with one pair of about 0.087 mm long, slightly caudad a pair of about 0.035 mm, between the compound eyes 4 of about 0.035 mm in a row; pronotum with 2 spinal pairs (0.075 mm), one pleuro-marginal pair (0.080 mm); mesonotum with 2 spinal pairs, the anterior pair nearly twice as far apart as the posterior pair (0.075 mm), and 2 marginal pairs (0.065 mm); metanotum with one spinal pair (0.075 mm), one pleural pair, one marginal pair and a small subspinal pair; abdominal tergites I—VII all with one spinal pair, one pleural pair and one marginal pair of 0.100—0.170 mm long, but between these, in the same transverse line, smaller processes of 0.050—0.110 mm long; caudad all these processes reach their maximum length; all processes pale, wrinkled, with only at the top four indistinct, bluntish spinules; dorsal hairs on top of processes very short, about 0.006 mm long, markedly knobbed, with the knob about as wide as the length of the thin shaft; a few hairs not placed on processes, cylindrical, blunt, about 0.009 mm long. Antennae very short, about $\frac{3}{5}$ of length of body, with blackish basal segments; flagellum brownish yellow with dark apex; cilia around primary rhinaria very indistinct; processus terminalis about as long as base of segment VI; hairs on segment III very scarce, less than 30 per mm length of segment. Underside of head with 6 hairs on the frontal bulge and 4 hairs between the eyes. Rostrum nearly reaching hind coxae; last segment nearly twice as long as its basal width, 0.122 mm long, with 4 hairs besides the 3 subapical pairs. Legs not very short; all femora blackish, tibiae pale with blackish base and apex, with very few, 2—5 spinules near apex; longest hair on first tarsal joint only 0.050 mm long; empodial hairs bent near base, but apparently cylindrical,

not spatulate. Siphunculi not much darker than dorsal sclerotisation, smooth or faintly striate, with large flange; subbasal hair on a tiny process. Cauda with the knob broader than long. Rudimentary gonapophyses 3.

Measurements in mm.

No.	Length	Ant.	Ant. segments				Siph.	Cau.
	body		III	IV	V	VI		
1	2.40	1.34	0.33	0.27	0.23	0.16 + 0.16	?	0.13

(from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E.I.S. 66-11-1a).

Discussion. The alata shows clearly that there is no generic difference between this species and the type-species of *Neuquenaphis* Blanchard, and consequently *Spicaphis* Essig, 1953, type-species *Spicaphis michelbacheri* Essig, 1953, p. 69, is here considered a synonym of *Neuquenaphis* Blanchard, 1939. But because there is already a *Neuquenaphis michelbacheri* Essig, 1953, p. 66, a name I want to retain, *Neuquenaphis michelbacheri* (Essig, 1953, p. 69) (transferred from *Spicaphis* Essig) requires a new name. Because the latter species, like *Neuquenaphis essigi* spec. nov., is known from only a single apterous specimen, it is in this case equally impossible to decide whether *essigi* spec. nov. is the same species as *Spicaphis michelbacheri* Essig, or a different species. I therefore refrain from giving a new name to *Neuquenaphis michelbacheri* (Essig, 1953, p. 69), and prefer to describe *Neuquenaphis essigi* as a new species, with *Spicaphis michelbacheri* Essig as a questionable synonym. In this context also the chapter on *Neuquenaphis chilensis* Essig should be consulted.

The greater number of dorsal processes in *N. essigi* (and *N. bulbicauda*) is not a satisfactory argument even for considering *Spicaphis* a subgenus of *Neuquenaphis*. Also *N. schlingeri* would then require a new taxon.

Recognition of this species is very easy, but it resembles *N. chilensis* which Essig (1953) suspected of being the alate morph of his *Spicaphis michelbacheri* (vide p. 269).

The differences in structure between alatae and apterae in this species are so great that one might think that they are not conspecific. However, in the alata embryos are present, and in one of these one can see hairs on top of dorsal processes exactly like those found in the aptera and in the embryos inside the latter. As in *Neuquenaphis michelbacheri*, there is confusion about the identity of the host plant species.

Types. Holotype: Apterous viviparous female, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E. I. Schlinger, no. 66-11-1a. Paratype: Alate viviparous female with data as for holotype.

Neuquenaphis flavipes spec. nov.

(Plate 16, fig. 10)

Alate viviparous female.

Body about 2.00—2.55 mm long. Head and thorax brownish black; abdomen with conspicuous intersegmental sclerites as dark as the siphunculi, and with usually less dark marginal sclerites and spinal sclerites on which the processes stand. Front, pronotum and mesonotum with spinal processes that are broader than their height (0.020 mm); ab-

domen with on the anterior 3 or 4 tergites dark, cylindrical or basally constricted spinal processes, the longest of which are about 0.060—0.080 mm; tergites IV, etc, with short processes, those on VII and VIII again longer, to 0.030 mm; on top of each a very acute hair of 0.030 mm. Antennae $1\frac{1}{3}$ — $1\frac{1}{2}$ times as long as body, brownish yellow, gradually darker to blackish brown towards apex with the part bearing the secondary rhinaria just darker than the part basad or apicad, nearly smooth basad the rhinaria but gradually more distinctly imbricated towards apex; segment III just below the middle with a short row of 4—9 (in two out of about 110 antennae: 3) transversely oval rhinaria with distinct cilia of about 0.0035 mm long; processus terminalis in our samples less than 0.75 mm long, $3\frac{1}{3}$ — $4\frac{1}{4}$ times as long as base of segment VI. Last rostral segment rather elongated, about 0.105—0.11 mm long, at base about half its length, with usually 6 hairs besides the 3 subapical pairs. Legs yellow to yellowish brown with the knees of the fore legs quite dark; hind femora not or hardly darker than the fore femora, always much paler than the siphunculi; maximum width of fore femora about 0.115 mm, length about 0.70 mm; second tarsal joints with many spinules but tibiae with at most about 10 spinules near apex. Wings with normal venation; veins in fore wings brown, clear cut, without dark triangles at their apices. Siphunculi mostly paler than mesosternum, distinctly reticulated with about 3—4 rows of nearly isodiametric cells and 4—5 rows of strongly transverse cells, with near base a hair of about 0.025 mm. Cauda slightly paler than siphunculi, with the slender knob $1\frac{2}{3}$ —2 times as long as its maximum width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	2.23	2.96	0.84	0.63	0.55	0.16 + 0.61	6 & 8	0.11	0.21
2	2.04	3.10	0.90	0.63	0.56	0.17 + 0.67	6 & 7	0.12	0.18
3	2.15	2.97	0.84	0.63	0.55	0.17 + 0.60	8 & 9	0.13	0.21
4	2.26	2.94	0.95	0.66	0.56	0.17 + 0.60	6 & 7	0.13	0.20
5	2.31	3.17	0.94	0.72	0.57	0.16 + 0.60	6 & 7	0.13	0.22
6	2.20	3.33	0.94	0.71	0.63	0.18 + 0.68	7 & 7	0.12	0.21

(All from *Nothofagus obliqua*, Chile; 1—2, Cuesta la Dormida (Santiago), 1.XI.'66, E.I.S. 66-11-1a; 3—4, 29 km E. of Padre de las Casas (Cautin), 10.XI.'66, E.I.S. 66-11-10a; 5, 12 km W. of La Union (Valdivia), 11.XI.'66, E.I.S. 66-11-11a; 6, Los Muermos (Llanquihue), 18.I.'67, Zuniga no. 11).

Discussion. Several samples of this species are available, some quite large. All consist of alatae and sometimes also nymphs. But as several similar *Neuquenaphis* live on *Nothofagus obliqua*, the identity of the nymphs usually is not quite certain. The alatae strongly resemble those of *N. edwardsi* (Laing). But of both species samples from several provinces are available, and these differ very clearly by the pigmentation of the legs, especially the hind femora. Small differences in the length of the spinal hairs, the number of spinules on the tibiae, and the length of the processus terminalis also help to distinguish the two species.

Alatoid nymphs and nymphs without wing pads are present in several samples, notably that from Los Muermos. They show the appropriate shape of the last rostral segment, fairly well developed submarginal processes, exceedingly short (0.004—0.006 mm)

hairs on the tops of the middorsal processes, and a processus terminalis of about 0.45—0.55 mm in the larger specimens. Though the dorsal processes are brownish, their bases are paler and the integumentum around their bases is not pigmented. None of the available apterae viviparae can with certainty be associated with the alatae of *flavipes* (vide sub *N. edwardsi* Laing).

Types. Holotype: Alate viviparous female (no. 6 of measurements), from *Nothofagus obliqua*, Los Muermos (Llanquihue), Chile, 18.I.'67, leg. E. Zuniga no. 11. Paratypes: 17 alate viviparous females with data as for holotype; 42 alata viviparous females, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E. I. Schlinger no. 66-11-1a; 4 alate females, from *Nothofagus obliqua*, 29 km E. of Padre de las Casas (Cautin), Chile, 10.XI.'66, leg. E. I. Schlinger and M. E. Irwin, no. 66-11-10a; 10 alate viviparous females, from *Nothofagus obliqua*?, 12 km W. of La Union (Valdivia), Chile, 11.XI.'66, leg. E. I. Schlinger and M. E. Irwin, no. 66-11-11a; 4 alate viviparous females, from *Nothofagus* sp., 4 km S. of Los Muermos (Llanquihue), Chile, 12.XI.'66, leg. E. I. Schlinger and M. E. Irwin no. 66-11-12b.

Additional material: 2 alate viviparous females, yellow trap, Santiago, Chile, VIII.'66, leg. Accatino no. 10.

Neuquenaphis michelbacheri Essig, 1953

(Plate 16, fig. 12)

1953. Essig, E. O., Proc. Calif. Acad. Sc. (IV) 28 : 66—67, *Neuquenaphis michelbacheri*.

Alate viviparous female.

Body about 1.70—2.25 mm long. Head and thorax blackish; abdomen pale with pale brownish intersegmental sclerites, sometimes with rather vague, paler, brownish sclerites at the bases of spinal dorsal processes and then these sclerites with a very pale centre. Processes on front and thorax not developed or just indicated; those on abd. tergites either colourless or just visibly pigmented; the spinal processes on tergites I—III cylindrical or tapering, rarely constricted at base, $2\frac{1}{2}$ to 8 times as long as their half-way width, up to about 0.070 mm long, with acute hairs of 0.016—0.026 mm on top, those on the posterior tergites and the marginal ones mostly not higher than their basal width. Antennae $1\frac{2}{5}$ — $1\frac{2}{3}$ times as long as body, with dark brown or black basal segments and brownish yellow, apicad darker flagellum; segment III less than one mm long, on the middle portion over $\frac{1}{4}$ or $\frac{1}{3}$ part of their length with 9—15 strongly transversely oval rhinaria with a distinct, complete, fringe of hairs of less than 0.003 mm long; processus terminalis less than one mm long, $4\frac{1}{2}$ — $5\frac{1}{2}$ times as long as base of segment VI; flagellum past the rhinaria gradually more distinctly imbricated. Rostrum about reaching to the middle coxae; last segment 0.087—0.098 mm long, about $1\frac{3}{4}$ times its basal width, with 4—6 hairs besides the 3 subapical pairs. Legs brownish yellow to yellowish brown, with dark knees to the fore legs; hind femora sometimes darker brown than the fore femora; apices of hind tibiae with very few, 1—9, spinules between the hairs. Fore wings with quite dark, seemingly clear cut veins, but basal vein with a vague brownish border, and all the veins with inconspicuous but distinct dark triangles at their tips. Siphunculi not black, but dusky brown, about like the coxae, with 5—6 rows of isodiametric reticulation and 1—2 rows of rather incomplete, strongly transverse, reticulation. Cauda paler than siphunculi, the rather small knob $1\frac{1}{2}$ —2 times as long as its maximum width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	1.73	2.79	0.75	0.57	0.49	0.13 + 0.70	9 & 11	0.09	0.14
2	2.01	2.85	0.80	0.54	0.48	0.14 + 0.73	10 & 10	0.11	0.17
3	2.00	2.93	0.78	0.60	0.50	0.15 + 0.72	9 & 10	0.12	0.20
4	2.22	3.30	0.91	0.65	0.56	0.16 + 0.83	13 & 13	0.14	0.20
5	2.01	3.20	0.93	0.64	0.53	0.16 + 0.77	15 & 15	0.14	0.19
6	1.95	3.02	0.86	0.62	0.55	0.15 + 0.69	10 & 10	0.12	0.18
7	1.85	2.96	0.83	0.56	0.49	0.15 + 0.76	8 & 10	0.12	0.18
8	1.72	2.78	0.68	0.55	0.51	0.14 + 0.73	9 & 10	0.11	0.18

(1—2, paratypes, from *Nothofagus dombeyi*, Temuco (Cautin), Chile, 28.I.'51, leg. A. E. Michelbacher; 3—5, from *Nothofagus obliqua*, 20 km E. of Padre de las Casas (Cautin), 10.XI.'66, leg. E.I.S. 66-11-10a; 6, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E.I.S. 66-11-1a; 7, from *Nothofagus obliqua*, 8 km W. of Angol (Malleco), Chile, 10.II.'66, leg. E.I.S. 67-2-10b; 8, from *Nothofagus dombeyi*, 8 km W. of La Picada, El Refugio, Volcan Osorno (Osorno), Chile, 6.II.'67, leg. E.I.S. 67-2-6c).

Discussion. Dr. Schlinger collected several samples that agree completely with the paratypes of *Neuquenaphis michelbacheri* Essig. At first sight the specimens look like *N. edwardsi*, to which it is closely related. But it differs by the pale spinal processes which are not or rarely placed on pigmented sclerotic plates. That might suggest more or less teneral specimens, or too long treatment with KOH. However, the dark wing veins and the triangles at the ends of the veins of the fore wings suggest more pigmentation, and it is the combination of the pale dorsal processes, the dark triangles and the higher average number of secondary rhinaria that have convinced me that two species are involved. Essig mentions 8—16 rhinaria, in his specimens, we found 8—15 in ours.

E. O. Essig gave the host plant as *Nothofagus dombeyi*, just as in *Neuquenaphis essigi* spec. nov., but Dr. Schlinger collected both species off *Nothofagus obliqua*, and only one *michelbacheri* from *Nothofagus dombeyi*. Most probably some mistake has been made in the identification of the host plant.

Apterae are not known. I do not exclude the possibility that they are among the apterous material listed in this paper under *Neuquenaphis edwardsi* Laing.

Types. Holotype: Alate viviparous female, from *Nothofagus dombeyi*, near Temuco (Cautin), Chile, 28.I.'51, leg. A. E. Michelbacher. Paratypes: 12 alate viviparous females with data as for holotype.

Further material: 1 alata, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E. I. Schlinger, no. 66-11-1a; 1 alata, from *Nothofagus obliqua*?, 19.6 km W. of Angol (Malleco), Chile, 9.XI.'66, leg. E. I. Schlinger and M. E. Irwin, no. 66-11-9a; 5 alatae, from *Nothofagus obliqua*, 29 km E. of Padre de las Casas (Cautin), 10.XI.'66, leg. E. I. Schlinger and M. E. Irwin, no. 66-11-10a; 1 alata, from *Nothofagus dombeyi*, 8 km W. of la Picada, El Refugio (Osorno), 6.II.1967, leg. E. I. Schlinger, no. 67-2-6c; 3 alatae, from *Nothofagus obliqua*, 18 km W. of Angol (Malleco), 10.II.'67, leg. E. I. Schlinger, no. 67-2-10b.

Neuquenaphis palliceus spec. nov.

(Plate 14, fig. 4; Plate 16, fig. 9)

Alate viviparous female.

Body rather large, about 2.25—2.90 mm long. Head brownish yellow, usually pale, always with very conspicuous blackish brown rings around the ocelli; pronotum about as dark as head; mesothorax darker but never blackish; abdomen either quite unpigmented, or with some small and inconspicuous, brownish, intersegmental sclerites. Front, pronotum, and mesonotum with very short (0.020 mm) darkish processes; abdomen on tergites I—III with very slender, almost cylindrical, quite colourless, up to about 0.10 mm long, spinal processes; the other tergites with conical, usually faintly brownish spinal processes of about 0.020—0.040 mm long; marginally on tergites II—V on each side mostly two short (0.015 mm) conical processes, though several may be undeveloped; on top of each dorsal process a long, fine and straight hair of 0.035—0.045 mm long. Antennae very long, $1\frac{2}{3}$ —2 times as long as body, pale, with the flagellum gradually darker towards apex; segment III at about $\frac{4}{9}$ of its length with 1—6 transversely oval rhinaria side by side; 2 and 5 rhinaria may occur on the same specimen; these rhinaria indistinctly ciliate, and parts of the rim apparently without hairs; processus terminalis more than one mm long, $5\frac{1}{2}$ — $7\frac{1}{4}$ times as long as basal part of segment VI. Rostrum very short; last segment short, only 0.080—0.090 mm long, blunt, about $1\frac{1}{4}$ times as long as its basal width, with 4—6 hairs besides the 3 subapical pairs. Legs long, pale brownish yellow, but the knees of the fore legs blackish brown; hind tibiae apparently without spinules on apical part; second tarsal joints with few distinct spinules on the imbrications. Wings with normal, rather dark venation, the basal vein just visibly bordered with very pale brown. Siphunculi dark, possibly sometimes blackish, darker than the mesosternum, with 5—7 basad less distinct rows of nearly isodiametric reticulation and some very indistinct transverse reticulation. Cauda pale, the knob rather tapering, about $1\frac{2}{3}$ — $1\frac{7}{9}$ times as long as its greatest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	2.94	4.83	1.32	1.04	0.94	0.19 + 1.09	4 & 5	0.16	0.22
2	2.78	4.99	1.29	1.09	1.02	0.21 + 1.15	3 & 4	0.21	0.24
3	2.49	4.67	1.21	0.96	0.92	0.16 + 1.21	3 & 4	0.15	0.21
4	2.57	4.68	1.31	0.99	0.95	0.16 + 1.09	3 & 3	0.14	0.22
5	2.49	5.01	1.35	1.04	0.97	0.20 + 1.23	3 & 3	0.15	0.19
6	2.50	4.76	1.30	0.89	0.89	0.18 + 1.15	2 & 3	0.17	0.21

(All from *Nothofagus dombeyi*; 1—2, 4 km SW. of Villarica (Cautin), Chile, 18.XII.'66, leg. E.I.S. 66-12-18a; 3, Las Trancas (Nuble), Chile, 28.I.'67, leg. E.I.S. 67-1-28e; 4, 35 km W. of Angol (Malleco), Chile, 12.II.'67, leg. E.I.S. 67-2-12b; 5, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E.I.S. 67-2-10d; 6, 8 km E. of Pucon (Cautin), Chile, 9.II.'67, leg. E.I.S. 67-2-9c).

Apterous viviparous female.

Body rather large, about 2.25—2.70 mm long, rather broadly pyriform. Tergum with more or less distinct, brownish, local sclerotisation; head pale to pale brownish; thoracic

nota and abd. tergites with colourless to brown spinal, pleural and marginal sclerites on each of which a dorsal process stands. Dorsal processes rather long and straight, slender, 10—12 times as long as their half-way width, the spinal ones on abd. tergite III about 0.17—0.22 mm long; submarginal processes on abdomen absent, or inconspicuous and not longer than their half-way width; processes light brown to brown with paler bases, moderately scabrous, with very small apical spinules. Hair on top of the processes tapering, 0.008—0.012 mm long, with the apex bluntish, not incrassate. Antennae pale yellowish, gradually darker towards the light brown apex, very long, $1\frac{2}{5}$ — $1\frac{2}{3}$ times as long as body; processus terminalis $4\frac{3}{4}$ — $5\frac{1}{2}$ times as long as basal part of segment VI. Rostrum not reaching the middle coxae; last segment about 0.080—0.085 mm long, blunt, not or hardly longer than its basal width, with 3—5 hairs besides the 3 subapical pairs. Siphunculi stout, pigmented like the sclerites, i.e., from very pale with just darker apex, to brown, near apex with 2—4 rows of slightly transverse reticulations which basad become very indistinct. Cauda also in pigmented specimens pale, with the oval knob about $1\frac{1}{2}$ — $1\frac{9}{10}$ times as long as its greatest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.68	3.58	1.00	0.68	0.62	0.16 + 0.87	0.21	0.28
2	2.36	3.66	1.00	0.70	0.64	0.17 + 0.88	0.17	0.27
3	2.29	3.66	0.94	0.76	0.66	0.18 + 0.89	0.20	0.27
4	2.49	3.53	0.96	0.69	0.67	0.18 + (0.81 +)	0.15	0.29

(1, from *Nothofagus dombeyi*, Petrohué (Osorno), Chile, 15.XI.'66, leg. E.I.S. 66-11-15a; 2—3, from *Nothofagus dombeyi*, 11.4 km E. of Llao Llao (Rio Negro), Argentine, 16.XI.'66, leg. E.I.S. 66-11-16a; 4, from *Nothofagus* sp., Puerto Eden, Wellington Island (Magallanes), Chile, 13.XII.'58, leg. Kuschel, BMNH no. 41/60).

Fundatrix.

Very much like preceding morph, but body slightly broader. Dorsum in the available specimens perhaps sclerotised but not pigmented. Dorsal processes slightly thicker and shorter. Submarginal processes on abd. segments I—IV very well developed, $\frac{1}{2}$ — $\frac{3}{4}$ times of the length of the nearest marginal processes. Antennae about $1\frac{1}{5}$ — $1\frac{2}{5}$ times length of body; processus terminalis $3\frac{1}{2}$ — $4\frac{1}{2}$ times as long as basal part of segment VI. Siphunculi brownish yellow, with 2—3 rows of strongly transverse reticulation near the flange, remainder smooth. Cauda with the knob $1\frac{1}{3}$ — $1\frac{2}{5}$ times as long as its greatest width. Other characters about as in the preceding morph.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.57	2.88	0.73	0.53	0.52	0.18 + 0.68	0.19	0.26
2	2.87	3.47	0.97	0.69	0.62	0.20 + 0.75	0.21	0.28
3	1.92	2.78	0.75	0.54	0.51	0.14 + 0.65	0.18	0.21
4	2.19	2.92	0.76	0.58	0.55	0.16 + 0.64	0.17	0.23
5	2.42	2.92	0.81	0.55	0.54	0.17 + 0.61	0.15	0.28
6	2.45	2.76	0.69	0.55	0.52	0.16 + 0.61	0.17	?

(1—2, from *Nothofagus dombeyi*, Petrohué (Osorno), Chile, 15.I.'66, leg. E.I.S. 66-11-15a; 3—4, from *Nothofagus dombeyi*, 11.4 km E. of Llao Llao (Rio Negro), Argentina, 16.XI.'66, leg. E.I.S. 66-11-16a; 5—6, from *Nothofagus* sp., Puerto Eden, Wellington Island (Magallanes), Chile, 13.XII.'58, leg. Kuschel, BMNH no. 41/60).

Discussion. Enough alatae from different collections are available for a good insight into the variability of that morph. Various nearly full grown alatoid nymphs with visible secondary rhinaria can with certainty be identified as belonging to the same species as the alatae with which they occurred in the samples.

Unfortunately apterae were in no case present in the same sample with alatae and therefore doubt about their identity persists. Another difficulty is that in most samples with apterae, there are two quite different kinds that because of the shape of their last rostral segment can only be *Neuquenaphis palliceus* spec. nov., unless there exists another species with an extremely blunt last rostral segment of which no alatae were collected. In one kind there are quite long submarginal processes, and therefore 8 dorsal processes on each of abdominal segments I—V, in the other kind submarginal processes are absent or minute, and only 6 dorsal processes on each of the mentioned abdominal segments are present. Such a reduction of the number of dorsal processes was also observed in the oviparae of *Neuquenaphis bulbicauda* spec. nov., in comparison with the apterae viviparae of that species.

Because the body and the cauda in specimens with submarginal dorsal processes tend to be broader, and the processus terminalis slightly shorter, I have tentatively described them as fundatrices of *Neuquenaphis palliceus* spec. nov. It is not significant that moderately to well developed submarginal processes occur in the mentioned alatoid nymphs, for in species in which the apterae have no trace of submarginal processes the alatoid nymphs always have them.

Types. All from *Nothofagus dombeyi*. Holotype: Alate viviparous female (no. 1 of measurements), 2 km SW. of Villarica (Cautin), Chile, 18.XII.'66, leg. E. I. Schlinger no. 66-12-18a. Paratypes: 41 alatae with collecting data as for holotype; 9 alatae, Las Trancas (Nuble), Chile, 28.II.'67, leg. E. I. Schlinger no. 67-1-28e; 3 alatae, 35 km W. of Angol (Malleco), Chile, 12.II.'67, leg. E. I. Schlinger no. 67-2-12b; 17 alatae, 8 km E. of Pucon (Cautin), Chile, 9.II.'67, leg. E. I. Schlinger no. 67-2-9c; 18 alatae, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E. I. Schlinger no. 67-2-10d; 1 alata, Las Trancas (Nuble), Chile, 15.II.'67, leg. E. I. Schlinger no. 67-2-15a; 5 fundatrices(?) and 1 aptera vivipara, Petrohué (Osorno), Chile, 15.XI.'66, leg. E. I. Schlinger and M. E. Irwin no. 66-11-15a; 3 fundatrices and 9 apterae viviparae, 11.4 km E. of Llao Llao (Rio Negro), Argentina, 16.XI.'66, leg. E. I. Schlinger and M. E. Irwin no. 66-11-16a.

Further material: 2 fundatrices(?) from *Nothofagus* sp., Puerto Eden, Wellington Island (Magallanes), Chile, 13.XII.'58, leg. Kuschel, BMNH no. 41/60; 1 aptera vivipara, host, locality and collector like preceding, but 4.XII.'58, BMNH no. 40/60; 2 alate viviparous females, no host, date or locality, leg. Roy. Soc. Exp. to S. Chile, 1958—59, HW 17 T 128, and some nymphs with similar data.

***Neuquenaphis schlingeri* spec. nov.**

(Plate 14, fig. 2; Plate 17, fig. 14)

Alate viviparous female.

Body about 1.40—1.70 mm long. Head very pale brown with blackish brown rings around the ocelli; thorax brown to dark brown; abdomen without any pigmentation. Dorsal processes either completely absent, or only very small and low ones on front and on abd. tergite VIII. Spinal hairs somewhat spiny, 0.011—0.021 mm long, only on abd. tergites VII and VIII sometimes on raised bases. Antennae pale yellow with dark brown apices, thin, $1\frac{1}{3}$ — $1\frac{1}{2}$ times as long as body; segment I with a low blunt process at inner apex; segment III with 1—3 round or broadly oval rhinaria at about $\frac{1}{3}$ from base, rather far apart; cilia present but very indistinct; processus terminalis much longer than segment III, $4\frac{3}{4}$ — $5\frac{1}{2}$ times base of segment VI. Rostrum hardly reaching middle coxae; last segment 0.060 mm long, hardly longer than its basal width, with 2—4 hairs besides the 3 subapical pairs. Legs slender, pallid with the much incrassate fore femora brownish yellow with blackish brown dorso-apical part; hind tibiae with rather numerous, perhaps 40 or 50, spinules on distal portion. Wings with normal, thin, rather dark brown veins, the fore wings with very dispersed scales over nearly their whole surface. Siphunculi very broadly conical, low, dark to probably black, without isodiametric cells, only with some rows of very strongly transverse cells on and just below the indistinct flange; submedial hair acute, 0.013—0.015 mm long. Cauda pale; the shortly acorn-shaped knob only $1\frac{1}{3}$ times as long as its largest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	1.40	1.84	0.41	0.31	0.28	0.11 + 0.61	1 & 2	0.06	0.17
2	1.83	2.67	0.57	0.45	0.52	0.15 + 0.83	2 & 2	0.06	0.16
3	1.67	2.55	0.57	0.41	0.45	0.17 + 0.80	2 & 3	0.07	0.15

(1—2, from *Nothofagus obliqua*, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E.I.S. 67-2-10b; 3, like no. 1 but E.I.S. 67-2-10g).

Apterous viviparous female.

Body rather pyriform, about 1.60—1.80 mm long. Tergum completely colourless, not visibly sclerotized. Dorsal processes pale, rather slender, to 10 times as long as their half-way width, slightly curved, slightly spinulose. Head only with 2 long (0.15 mm), frontal processes; pronotum without processes; from mesothorax to abd. segment IV each segment with 2 long marginal processes, 2 submarginal processes $\frac{1}{3}$ — $\frac{1}{2}$ of the length of the marginal ones, and 2 very short, often completely absent, spinal processes of at most 0.040 mm long; tergite VI with long marginal processes, and submarginal processes of 0.040—0.080 mm; tergite VII with 2 long spinal processes and 2 long marginal processes; tergite VIII only with 2 moderately long (0.050—0.080) spinal processes; pleural processes absent. Hairs on top of the processes about 0.012—0.014 mm long, cylindrical, quite blunt or with slightly incrassate apex. Antennae pale with blackish brown apices, $1\frac{1}{5}$ — $1\frac{2}{5}$ times as long as body; segment V as long as, or longer than segment III; processus terminalis 5—6 times as long as basal part of segment VI, to twice as long as

segment III. Rostrum short, only just reaching to the middle coxae; last segment very short, to 0.070 mm long, hardly or not longer than its basal width, with 2—4 hairs besides the 3 subapical pairs. Legs pale; hind tibiae slightly incrassate on basal $\frac{1}{3}$ part and there with 5—30 rather flat pseudosensoria; on distal half an unusually large number of spinules, some 50—70 in number. Siphunculi rather low conical, dusky on distal half or above, ornamented as in alatae or more extensively so. Cauda pale, the thick knob shortly acorn-shaped, only $1\frac{1}{4}$ — $1\frac{1}{3}$ times as long as its largest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	1.79	2.30	0.37	0.34	0.41	0.15 + 0.88	0.07	0.13
2	1.76	2.30	0.43	0.37	0.40	0.14 + 0.79	0.07	0.17
3	1.67	2.34	0.38	0.35	0.39	0.14 + 0.81	0.08	0.16
4	1.66	2.16	0.38	0.34	0.40	0.13 + 0.75	0.09	0.16
5	1.66	2.32	0.42	0.33	0.43	0.15 + 0.83	0.07	0.13
6	1.62	2.04	0.36	0.30	0.36	0.12 + 0.68	0.07	0.17
7	1.64	1.96	0.36	0.29	0.36	0.13 + 0.67	0.09	0.16
8	1.66	?	0.26	0.24	0.33	0.12 + ?	0.09	0.16

(All from *Nothofagus obliqua*; 1—4, 15 km E. of Curanipe (Maule), Chile, 24.I.'67, leg. E.I.S. 67-1-24a; 5—7, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E.I.S. 67-2-10c; 8, 20 km E. of Padre de las Casas (Cautin), Chile, 10.XI.'66, leg. E.I.S. 66-11-10a).

Discussion. The species can very easily be recognized by the distribution of dorsal processes in apterae viviparae, the virtual absence of such processes in alatae, the long processus terminalis, short last rostral segment, etc.

In seven of the apterae described the hind tibiae have pseudosensoria as in oviparae, but they contain many embryos and no eggs. In specimen no. 8 the antennal segments are very much shorter than in the others, the tibiae have short, faintly capitate hairs on the dorsal surface on basal half, and the hind tibiae have no pseudosensoria. This might be a fundatrix.

The pattern of the dorsal processes in embryos seems to be essentially like that of older larvae; only the marginal processes are elongate, the others obsolete; the hairs on top of the processes are very short, at most 0.005 mm long, but very distinctly knobbed.

Types. Holotype: Apterous viviparous female (no. 1 of measurements), from *Nothofagus obliqua*, 15 km E. of Curanipe (Maule), Chile, 24.I.'67, leg. E. I. Schlinger no. 67-1-24a. Paratypes: 3 apterae viviparae, with data as for holotype; 6 apterae viviparae and 3 alatae, from *Nothofagus obliqua*, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E. I. Schlinger no. 67-2-10g and 67-2-10b; 1 aptera vivipara (fundatrix?), from *Nothofagus obliqua*, 20 km E. of Padre de las Casas (Cautin), Chile, 10.XI.'66, leg. E. I. Schlinger and M. E. Irwin no. 66-11-10a.

Neuquenaphis sensoriata spec. nov.

(Plate 14, fig. 1; Plate 16, fig. 11)

Alate viviparous female.

Body about 1.70—2.05 mm long. Head and thorax black or blackish; abdomen with small pale to dark brown intersegmental sclerites and with or without very small and

inconspicuous pale brownish sclerites at the bases of spinal hairs or processes. Processes on head and thorax absent or reduced to low hills; those on abdominal tergite I—III to about 0.080 mm long but mostly much shorter, usually slender and up to 10 times as long as their half-way width, not or rarely constricted near base, usually slightly pigmented and then nearly always paler at apex than at base, with on top a hair of up to 0.022 mm with a rarely quite blunt, usually very nearly acute apex; processes on more posterior tergites small or undeveloped while those on tergite VIII are hardly larger than those on tergites VI or V. Antennae $11\frac{1}{10}$ — $12\frac{2}{5}$ times as long as body; basal segments dark to blackish, flagellum with the part basad the secondary rhinaria pale, the rest brownish to dark brown; segment III with 12—30 rhinaria, in an uneven, partly double, row starting at basal $\frac{1}{3}$ — $\frac{2}{5}$ part and ending at $\frac{3}{4}$ — $\frac{9}{10}$ of the length of the segment; cilia around the rhinaria rarely up to 0.0035 mm, normally shorter; processus terminalis short, only $2\frac{1}{2}$ — $3\frac{1}{6}$ times as long as base of segment VI. Rostrum just reaching middle coxae; apical segment rather long, 0.10—0.11 mm, with rather straight sides, twice as long as its basal width, with 7—12 hairs besides the 3 subapical pairs. Legs brownish yellow with blackish knees to the fore femora, distinct darker apices to the tibiae; hind femora much darker than fore femora, up to almost black; apices of hind tibiae with very few, perhaps 3—8, spinules. Wings with normal venation; veins dark, under high power with a very vague brownish border, and with hardly noticeable dusky triangles at their tips. Siphunculi dark to blackish, with 3—4 rows of isodiametric cells and 3—4 rows of strongly transverse reticulation. Cauda slightly paler than the siphunculi, the knob consisting of a thick globular part with a slightly thinner cylindrical, apically rounded part on top, therefore only $1\frac{1}{2}$ — $1\frac{3}{4}$ times as long as its largest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Rhin. on III	Siph.	Cau.
			III	IV	V	VI			
1	1.89	2.16	0.73	0.38	0.33	0.13 + 0.41	17 & 20	0.11	0.18
2	1.97	2.25	0.73	0.41	0.39	0.13 + 0.40	23 & 25	0.12	0.16
3	1.88	2.19	0.73	0.40	0.39	0.13 + 0.40	20 & 22	0.12	0.17
4	1.78	2.20	0.72	0.44	0.36	0.13 + 0.38	19 & 23	0.12	0.17
5	1.86	2.17	0.66	0.46	0.33	0.14 + 0.33	14 & 16	0.10	0.16
6	1.89	2.29	0.76	0.49	0.30	0.15 + 0.30	16 & 17	0.09	0.15
7	1.95	2.22	0.70	0.43	0.36	0.15 + 0.38	15 & 17	0.11	0.18
8	1.86	2.35	0.76	0.46	0.39	0.15 + 0.43	12 & 14	0.12	0.15

(1—4, from *Nothofagus obliqua*?, 19.6 km W. of Angol (Malleco), Chile, 9.XI.'66, leg. E.I.S. 66-11-9a; 5—7, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 11.XI.'66, leg. E.I.S. 66-11-1a; 8, from *Nothofagus obliqua*, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E.I.S. 67-2-10b).

Apterous viviparous female.

Body broadly oval, about 1.90—2.10 mm long. Head and pronotum rather dark brown sclerotic, meso- and metanotum and all abdominal tergites with corrugated, brown, spinopleural sclerotic transverse bars on which the spinal and pleural processes stand. Submarginal processes absent. Dorsal processes long, on tergite VII 0.25—0.32 mm long, mostly slightly curved, rather stout, e.g., those on tergite III 5—7 times as long as their half-way width, pale with the very base and the apical half dark to brown; distal third

unusually smooth, and the 4—5 apical spinules blunt to semiglobular, the hairs on top of mid-dorsal processes exceedingly short, 0.004 mm long or shorter, mostly not extending past the apical "spinules", with rather globular, thin tips. Antennae just over half as long as body, brown with basal part of segment III pale; processus terminalis $1\frac{1}{2}$ —2 times as long as base of segment VI. Rostrum reaching past middle coxae; last segment 0.11—0.125 mm long, with 8—11 hairs besides the 3 subapical pairs. Siphunculi blackish brown with the very base partly pale, nearly smooth with some rows of transverse reticulation on or just below the wide flange. Cauda brown with the knob consisting of a globular and a blunt conical part or acorn-shaped, $1\frac{1}{2}$ times as long as its largest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.02	1.11	0.32	0.13	0.18	0.11 + 0.21	0.11	0.23
2	2.07	1.17	0.32	0.17	0.21	0.13 + 0.19	0.11	0.22
3	1.94	1.03	0.29	0.14	0.17	0.11 + 0.18	0.11	0.21

(1—2, from *Nothofagus obliqua*?, 19.6 km W. of Angol (Malleco), Chile, 9.XI.'66, leg. E.I.S. 66-11-9a; 3, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 11-XI.'66, leg. E.I.S. 66-11-1a).

Discussion. Most alatae of this species can easily be recognized by the high number of rhinaria on antennal segments III; when there is an overlap with other species, the short processus terminalis and the number of hairs on the last rostral segments may help. It is likely that specimens with less than twelve secondary rhinaria occur because sample E.I.S. 66-11-1a consists of only 13 specimens with 12—19 rhinaria. In sample E.I.S. 66-11-9a the following numbers occur: 14 (1 x), 15 (1 x), 17 (4 x), 18 (2 x), 19 (5 x), 20 (13 x), 21 (9 x), 22 (7 x), 23 (14 x), 24 (12 x), 25 (3 x), 26 (1 x), 27 (1 x), and 30 (1 x).

The apterae almost certainly belong to the same species as the alatae with which they were collected. For they also show a rather long last rostral segment with a high number of hairs, a short processus terminalis, etc.

First instar larvae have a last rostral segment of 0.096 mm, marginal dorsal processes of up to 0.11 mm, while the spinules on top of these processes are semiglobular. Alatoid nymphs with a discernible high number of secondary rhinaria have normal, sharply spinulose, dorsal processes, including short submarginal ones, on abdominal tergites I—IV.

Types. Holotype: Alate viviparous female (no. 1 of measurements), from *Nothofagus obliqua*?, 19.6 km W. of Angol (Malleco), Chile, 9.XI.'66, leg. E. I. Schlinger no. 66-11-9a. Paratypes: 36 alatae and 4 apterous viviparous females with data as for holotype; 13 alatae and 3 apterae, from *Nothofagus obliqua*, Cuesta la Dormida (Santiago), Chile, 1.XI.'66, leg. E. I. Schlinger no. 66-11-1a.

Additional material: 1 alata, from *Nothofagus obliqua*, 18 km W. of Angol (Malleco), Chile, 10.II.'67, leg. E. I. Schlinger no. 67-2-10b.

***Neuquenaphis similis* spec. nov.**

(Plate 14, fig. 3)

Apterous viviparous female.

Body about 2.65—2.80 mm long, elongated pyriform. Head pale brownish; thorax and abdomen pale, to faintly brownish around the bases of the dorsal processes. The latter arranged as usual, but erratically short submarginal processes present, 1—2 per body and mostly on abd. tergites IV and III; spinal processes on abd. tergite II—III about 0.13—0.17 mm long, and about 7—8 times as long as their half-way width, brown with paler bases, with rather faintly imbricated distal part. Hairs on top of dorsal processes stout, with a rather cylindrical shaft and swollen, indistinctly longitudinally striate apex, about 0.013—0.022 mm long. Antennae about $1\frac{2}{5}$ — $1\frac{1}{2}$ times as long as body, with brown basal segments; flagellum brownish yellow with dark brown apex; processus terminalis 4— $4\frac{1}{2}$ times as long as basal part of segment VI; hairs on ant. segment III rather long, 0.016 mm, stiff, just blunt, numerous so that about 80—90 hairs per mm length of flagellum occur. Rostrum just reaching hind coxae; last segment about 0.13—0.14 mm long, with 4—6 hairs besides the 3 subapical pairs. Legs long, especially the tibiae, yellowish brown with darker femora; second tarsal joints distinctly but very superficially imbricated, with very few, perhaps 5—8 spinules ventrally. Siphunculi pigmented like the femora, smooth, with only on the large flange 2—3 rows of coalescing striae or strongly transverse reticulation. Cauda paler than siphunculi, the rather thick, very blunt knob about $1\frac{1}{2}$ times as long as its greatest width.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	2.68	3.87	0.96	0.89	0.75	0.18 + 0.85	0.19	0.30
2	2.75	4.09	1.00	0.89	0.81	0.21 + 0.87	0.16	0.29
3	2.77	4.01	1.02	0.89	0.76	0.21 + 0.83	0.20	0.31

(1—3, from *Nothofagus obliqua*, 20 km E. of Caramavida (Arauco), Chile, 31.I.'67, leg. E.I.S. 67-1-31b).

Discussion. Of a few *Neuquenaphis* species, including some known from *Nothofagus obliqua*, only alatae are known. Therefore it seems possible that the apterae described here as *Neuquenaphis similis* might belong to *N. sensoriata*, *N. flavipes* or *N. michelbacheri*. But the processus terminalis in alate *N. sensoriata* and *N. flavipes* is too short. The embryos in *N. similis* are quite characteristic, with capitate dorsal hairs of about 0.009 mm long, and they have faintly capitate hairs on the femora. In *N. sensoriata*, *N. flavipes*, and also in *N. michelbacheri* the embryos have dorsal hairs of 0.002—0.004 mm, and the femora have acute hairs. Apparently there must be still another kind of alatae on *Nothofagus obliqua*, of which by analogy one can predict that it has the antennae at least $1\frac{1}{2}$ times as long as body, probably quite long dorsal hairs, and embryos with dorsal hairs of at least 0.009 mm long.

Types: Holotype: Apterous viviparous female (no. 1 of measurements), from *Nothofagus obliqua*, Caramavida (Arauco), 31.I.1967, leg. E. I. Schlinger no. 67-1-31b. Paratypes: 5 apterae with collecting data as for holotype.

TYPES

In British Museum (Natural History), London: holotype and paratypes of *Myzocallis edwardsi* Laing, paratypes of *Neuquenaphis bulbicauda* spec. nov., *N. flavipes* spec. nov., and *N. sensoriata* spec. nov. In Science Museum of California Academy of Sciences, San Francisco: holotype of *Neuquenaphis chilensis* Essig, holotype and paratypes of *N. michelbacheri* Essig, holotype of *Spicaphis michelbacheri* Essig. In Essig collection in Entomology Division, University of California, Berkeley: paratypes of *Neuquenaphis chilensis* Essig and *N. michelbacheri* Essig. In Agricultural Experimental Station, La Rinconada near Maipo, Chile: holotypes of *Neuquenaphis bulbicauda* spec. nov., *N. palliceps* spec. nov., *N. schlingeri* spec. nov., *N. sensoriata* spec. nov., *N. similis* spec. nov., as well as paratypes of most of these species and of *N. flavipes* spec. nov. In Department of Entomology, University of California, Riverside: paratypes of the mentioned new species excepting *N. essigi* spec. nov. In the author's collection: holotypes of *N. essigi* spec. nov., and *N. flavipes* spec. nov., and paratypes of all the new species, of *Myzocallis edwardsi* Laing, and of *Neuquenaphis michelbacheri* Essig.

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